CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 86-1

WASTE DISCHARGE REQUIREMENTS
(SITE CLEANUP REQUIREMENTS) FOR:

HEWLETT PACKARD
DEER CREEK ROAD
PALO ALTO
SANTA CLARA COUNTY

STANFORD UNIVERSITY
PALO ALTO
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

1. Hewlett Packard, hereinafter called a discharger, by application submitted January 14, 1986 has applied for issuance of Waste Discharge Requirements for their site at 3500 Deer Creek Road in Palo Alto. The land is owned by Stanford University, also considered a discharger.

2. The site occupied by Hewlett Packard consists of Building 25, a research and development lab, Building 26, which is currently under construction, and a small chemical storage building constructed south of Building 25 as shown on Attachment 1, Site Plan, hereinafter a part of this Order. Building 25 was constructed in 1970 by Fairchild Camera and Instrument Company. Hewlett Packard took possession of the site in 1974.

3. The site is located in the foothills of the Santa Cruz Mountains west of Deer Creek Road Between Page Mill and Arastradero Roads. The land has been leased by Hewlett-Packard since 1972.

4. In 1975 Hewlett-Packard installed a 2000 gallon capacity tank to store waste organic solvents generated by facility processes. The organic solvents included trichloroethylene (TCE), xylene, isopropanol, methanol, and acetone. In October 1980 Hewlett-Packard discovered that this tank had developed a leak. In February 1981, a preliminary investigation, consisting of four shallow borings drilled within a 20-foot radius of the tank, showed that pollutants had migrated into the soil. Subsequent investigation found TCE in the groundwater at concentrations as high as 310,000 ppb and trans-1,2-dichlorethene at concentrations as high as 120,000 ppb. In April, 1981 the damaged tank and approximately 40 to 50 cubic yards of polluted soil were removed.

5. The buildings are situated on a hillside that slopes down steeply at the edge of a parking lot to the creek terrace area west of the buildings. The tank was removed from the eastern edge of the parking lot in a region found to be underlain by the continental Santa Clara Formation. A thin clay layer encountered in this area at about 34 feet below the surface is believed to prevent pollutant migration to deeper aquifers.

6. A second clay layer, approximately 10 feet thick, occurs in the vicinity of the solvent tank leak at an approximate depth of 70 feet. No pollutants were detected in the saturated unit between the two clay layers.

7. The area between the parking lot and Deer Creek consists of a stream terrace which is about 12 feet lower in elevation than the parking lot. The thin upper clay layer does not extend beneath the terrace. However, other units of the Santa Clara Formation, including the second deeper clay layer, are continuous beneath the terrace. Analysis of water samples taken from a deep well completed in the creek terrace below the 10-foot thick clay layer did not detect solvents.

8. The regional groundwater gradient is easterly from the site toward San Francisco Bay; however, a localized westerly hydraulic gradient exists across the site toward Deer Creek. Approximately 3/4 mile north of the site, Deer Creek joins Matadero Creek, which flows eastward through the city of Palo Alto in the Matadero Canal to Mayfield Slough, an extention of South San Francisco Bay.

9. Since October 1982 water has been pumped at a rate of 0.1 to 0.5 gpm from well B-4 located on the western side of the parking lot through a facility scrubber to reduce solvent concentrations to levels acceptable for discharge to the City of Palo Alto sewer system. Initially the discharger's consultants predicted that the capture zone of this well would be sufficiently large to intercept the pollutants in the groundwater below the site and that additional pumping wells would not be required.

10. Since June 1984 water from Deer Creek has been sampled and analyzed quarterly for several compounds. Low levels of trans-1,2-DCE (98ppb) were detected in samples taken from the portion of the stream directly across from the site. Samples taken from Deer Creek downstream (.7 miles) from the site showed non-detectable levels of pollutants.

11. There are 11 municipal wells within a three-mile radius of this site; the closest is 1.8 miles from the site. Five of these are located in Los Altos and are used to augment the city water supply during periods of peak demand. The remaining 6 are reserve back-up wells for the City of Palo Alto. All of these wells are screened at depths greater than 200 feet.

12. There are several private wells in the surrounding areas. None of these are located within the known plume of groundwater pollution from this site.

13. The discharger submitted a proposed groundwater investigation plan to the Regional Board staff on October 30, 1985. The plan, which has been approved by the Executive Officer, proposes an additional two to five monitoring wells to further define the lateral and vertical extent of pollution downgradient from the source. The plan also includes an evaluation of current and potential remedial action plans for the site.

14. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on July 21, 1982. The Basin Plan contains water quality objectives for South San Francisco Bay and contiguous surface and groundwaters.

15. The beneficial uses of South San Francisco Bay and tributary water bodies are:

municipal water supply
domestic water supply
water contact recreation
non-contact water recreation
wildlife habitat
warm and cold fresh water habitat
fish migration
industrial service and process supply
navigation
agricultural water supply

16. The beneficial uses of the groundwaters are:

municipal water supply
domestic water supply
industrial service and process supply
agricultural water supply

17. The Board has notified all interested agencies and persons of its intent to prescribe waste discharge requirements for this discharger.

18. The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

19. This project constitutes a minor modification to land and such activity is thereby exempt from the provisions of the California Environmental Quality Act (CEQA) in accordance with Section 15304 of the Resources Agency Guidelines.

IT IS HEREBY ORDERED, that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS:

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect beneficial uses of the groundwaters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants or adversely spread any pollutants from other sites is prohibited.

4. Bypassing of wastewater from the wastewater treatment system to waters of the State is prohibited. If bypassing should occur, the dischargers shall notify this board's Executive Officer as soon as possible.

B. SPECIFICATIONS:

1. The storage, handling, treatment or disposal of polluted soil or groundwater shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The discharger shall conduct activities as needed to define the local hydrogeological conditions, and the lateral and vertical extent of the soil and groundwater pollution in and contiguous to the zone of known pollution. Should monitoring results show evidence of plume migration, additional plume characterization shall be required.

C. PROVISIONS:

1. In order to comply with Specification B.2, the discharger shall meet the following compliance time schedule:

	TASKS	COMPLETION DATE
a.	Submit an interim data report to the Board on the results (well logs, chemical analyses), and preliminary conclusions, of the following tasks:	March 15, 1986
	(1) Complete the definition of pollutant distribution in the first encountered saturated unit in the stream terrace area to Deer Creek Road.	
	(2) Determine if pollutants have migrated to the next deeper saturated unit in the stream terrace area.	
b.	Submit a final report, to include an an analysis of the results of tasks a(1) and a(2) above.	April 14, 1986
c.	If the pollutants have migrated to the next deeper saturated unit in the stream terrace area, submit a report to the Board detailing the results of the following tasks:	July 1, 1986
	(1) Completion of the lateral definition	

of the pollutant plume to Deer Creek Road in the deeper unit.

(2) Determination if pollutants have migrated vertically to the next deeper saturated zone.

d. If the pollutant plume remains undefined after completion of Tasks 2.a and 2.b, complete the following tasks:

(1)	Submit a proposal to the Board for further investigation that will lead to complete vertical and lateral definition of the pollutant plume.	August 1, 1986
(2)	Implement the approved plan and submit a report to the Board on the results and conclusions of this investigation.	December 1, 1986

2. In order to comply with prohibition A.1, the discharger shall meet the following compliance time schedule:

	TASKS	COMPLETION DATE
a.	Submit a report to the Board on the results of the following tasks:	April 14, 1986
(1)	Evaluate beneficial uses for Deer Creek and shallow groundwater in the site vicinity.	
(2)	Evaluate Deer Creek stream flow and water quality.	
b.	Submit a report on the results of a study to assess pollutant transport: discharge into Deer Creek and plume migration and dispersion in groundwater below the creek terrace.	August 15, 1986

3. In order to comply with prohibitions A.1 and A.2, the dischargers shall meet the following compliance time schedule:

	TASKS	COMPLETION DATE
a.	Submit a report evaluating the effectiveness of interim pumping from well B-4 in the parking lot area and well B-13 in the creek terrace.	April 14, 1986
b.	Submit a report evaluating cleanup	

alternatives and recommending an interim cleanup strategy for the site acceptable to the Executive Officer.
If plume definition is completed after Task 2.b - August 15, 1986
If plume definition is completed after Task 2.c(2) - November 1, 1986
If plume definition is completed after Task 2.d(2) - April 1, 1987

c. Complete construction and implement approved cleanup alternative.
If plume definition is completed after Task 2.b - February 15, 1987
If plume definition is completed after Task 2.c(2) - May 1, 1987
If plume definition is completed after Task 2.d(2) - October 1, 1987

4. The above actions should provide the discharger with the information necessary for projection of the time requirements and ultimate concentrations of pollutants remaining in the groundwater under the cleanup program, and estimates of the cost and effectiveness of a range of pending final cleanup alternatives. This information will be presented for Board consideration no later than one year following the implementation date specified above in Provision 3.c. Final cleanup limits shall be considered by the Board once compliance with Specifications B.1 and B.2 and Provision C.3 is achieved.

5. The discharger shall submit to the Board brief bi-monthly letter reports on the status of the investigation by the 15th day of alternating months beginning March 15, 1986.

6. The discharger shall submit to the Board quarterly monitoring reports beginning March 15, 1986 which will contain the information specified in the attached self-monitoring program.

7. All samples shall be analyzed by State-approved laboratories using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

8. The discharger shall permit the Board or its authorized representative in accordance with Section 13267(c) of the California Water Code:

   a. Entry upon premises on which any pollution sources exist, or may potentially exist, or on which any required records are kept;

   b. Access to copy any records required to be kept under terms and conditions of this order.

   c. Inspection of any monitoring equipment or methods required

by this order.

d. Sampling of any groundwater or soil which is accessible, or may become accessible as part of any investigation or remedial action program, to the dischargers.

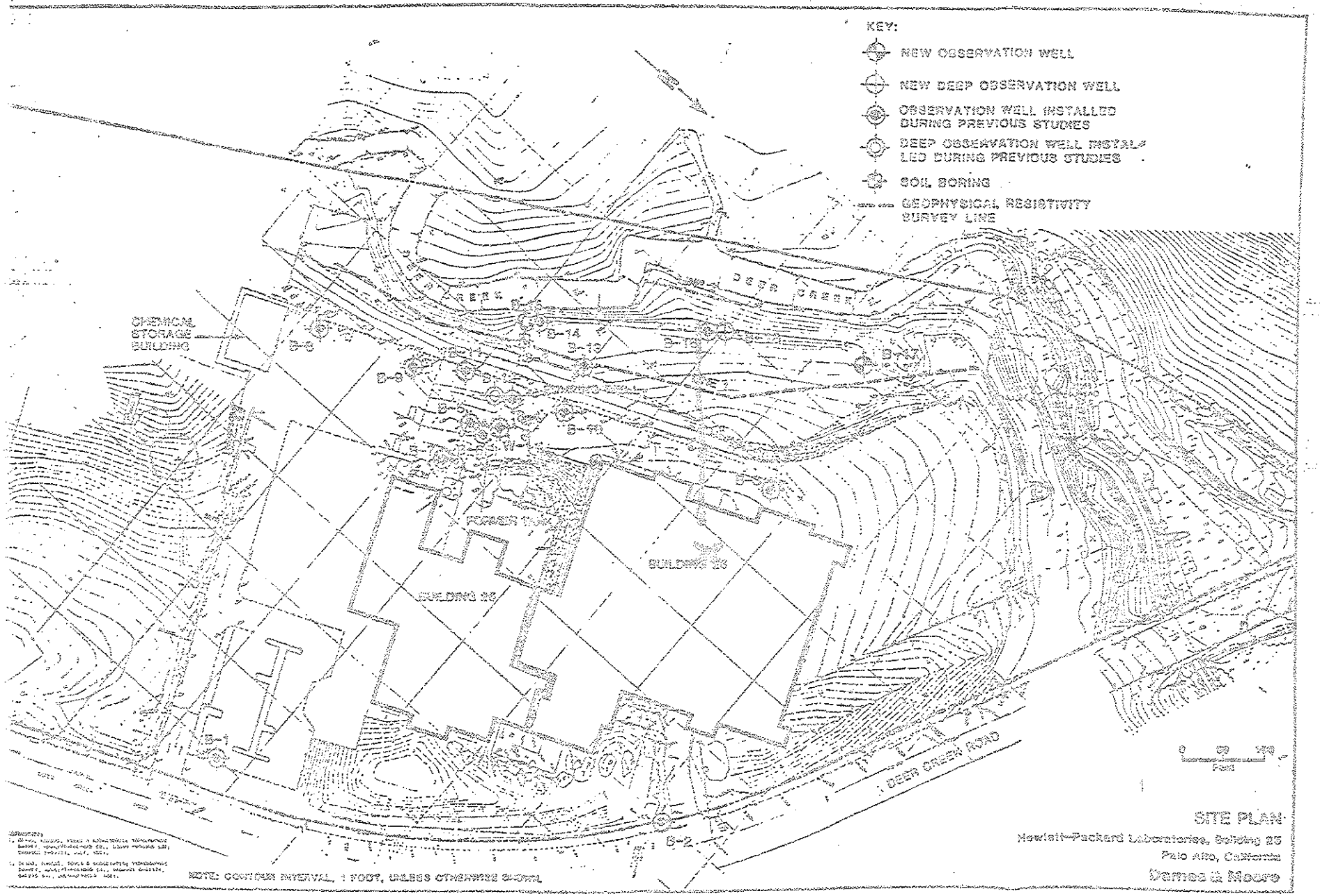
9. The dischargers shall file a report on any material changes in the nature, quantity or transport of polluted groundwater associated with the conditions described in this Order.

10. The dischargers shall maintain in good working order and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

11. The Board will review this Order periodically and may revise the requirements when necessary. This may include further investigation and cleanup if warranted by monitoring results and other considerations.

I, Roger B. James, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on February 19, 1986.

ROGER B. JAMES
Executive Officer



NOTE: CONTOUR INTERVAL, 1 FOOT, UNLESS OTHERWISE SHOWN

SITE PLAN

Hewlett-Packard Laboratories, Building 25

Palo Alto, California

Dames & Moore

Figure 1

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

T E N T A T I V E

SELF-MONITORING PROGRAM
FOR

Hewlett Packard, Deer Creek Road

Stanford University

ORDER NO. 86-1

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13268, 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16.

The principal purposes of a monitoring program by a waste discharger, also referred to as self-monitoring program, are: (1) to document compliance with waste discharge requirements and prohibitions established by this Regional Board, (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of effluent of other limitations, discharge prohibitions, national standards or performance, pretreatment and toxicity standards, and other standards, and (4) to prepare water and wastewater quality inventories.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the latest edition of Standard Methods for the Examination of Water and Wastewater prepared and published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation, EPA "Test Methods" for organic chemical analysis, or other methods approved and specified by the Executive Officer of this Regional Board.

C. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Violations of Requirements

In the event the discharger is unable to comply with the conditions of the waste discharge requirements and prohibitions due to:

(a) maintenance work, power failures, or breakdown of waste treatment equipment, or

(b) accidents caused by human error or negligence, or

(c) other causes such as acts of nature,

(d) poor operation or inadequate system design,

The discharge shall notify the Regional Board office by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written report shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to prevent the problem from recurring.

The discharger shall file a written report at least 15 days prior to advertising for bid on any construction project which would cause or aggravate the discharge of waste in violation of requirements; said report shall describe the nature, costs, and scheduling of all action necessary to preclude such discharge.

In addition, if the noncompliance caused by items (a), (b), (c), or (d) above is with respect to any of the effluent limits, the waste discharger shall promptly accelerate this monitoring program as required by the Board's Executive Officer for those constituents which have been violated. Such analysis shall continue until such time as the effluent limits have been attained, or until such time as the Executive Officer determines to be appropriate. The results of such monitoring shall be included in the regular Self-Monitoring Report.

2. Bypass Reports

Bypassing reporting shall be an integral part of regular montioring program reporting. A report on bypassing of untreated waste or bypassing of any treatment units shall be made which will include cause, time and date, duration and estimated volume bypassed, method used in estimating volume, and persons and agencies notified. Notification to the Regional Board shall be made immediately by telephone (415-464-1255), followed by a written account within 15 days.

3. Self-Monitoring Reports

a. Reporting Period:

Written reports shall be filed regularly for each calendar quarter by the fifteenth day of the following month.

b. Letter of Transmittal:

A letter transmitting self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period and actions taken or planned for correcting any requirement violation. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to this correspondence will be satisfactory.

Monitoring reports and the letter transmitting reports shall be signed either by a principal executive officer or other duly authorized employee. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct.

c. Data Results:

(1) Results from each required analysis and observation shall be submitted in the quarterly self-monitoring report. Results shall also be submitted for any additional analyses performed by the discharger for parameters for which effluent limits have been established by the Board.

(2) The report shall include a discussion of unexpected operational changes which could affect performance of the treatment system, such as flow fluctuations, maintenance shutdown, etc.

(3) The report shall also include a table identifying by method number the analytical procedures used for analyses. Any special methods shall be identified and should have prior approval of the Board's Executive Officer.

(4) Lab results should be copied and submitted as an appendix to the regular report.

(5) A map shall accompany the report, showing sampling locations and flow path to receiving waters.

(6) The report shall include an annual waste summary by month, for the current year showing the minimum, maximum, and average value for the month. The report for December shall include minimum, maximum and average for the year.

D. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

Station	Description
I-1,2	At wells B-4 and B-13 where groundwater is extracted immediately prior to treatment.

B. EFFLUENT

Station	Description
E-1,2	At wells B-4 and B-13 at the outlet from the groundwater treatment system prior to discharge to the city sewer system.

C. GROUNDWATER

Station	Description
B-9,10,12,17,18	Points on the edge of the pollutant plume.

D. SURFACE WATERS

D-1	At a point in Deer Creek across from the site.
D-2	At a point in Deer Creek downstream from the site -- Deer Creek Bridge.

E. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis shall be that given as Table I.

I, Roger B. James, Executive Officer, do hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 86-1.

2. Was adopted by the Board on February 19, 1986.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer.

ROGER B. JAMES
Executive Officer

Attachments: Table I

TABLE 1

SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	I-1,2	E-1,2	B9,10,12, 17,18	D-1,2							
TYPE OF SAMPLE											
EPA 601/602 (TCE, 1,1DCE, Trans-1,2-DCE, TCA, Ethylbenzene, toluene, acetone, freon, 2-propanal, tolal xylenes	Q	Q	Q	Q							
EPA 624	Y	Y	Y	Y							

LEGEND FOR TABLE

G = grab sample
D = once each day
M = once each month
Q = quarterly, once in March, June, September and December
M/Q = monthly for three months at startup of operation; reduced to quarterly thereafter
Y = once each year